

# The Flyway

Fall 2021

Quarterly newsletter for Billy Frank Jr. Nisqually and Grays Harbor National Wildlife Refuges

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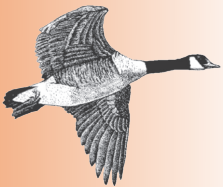
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*For us at Billy Frank Jr. Nisqually National Wildlife Refuge it is not only a time to prepare for winter maintenance projects and educational programs for students, but a time for us to observe the summer's habitat management work and learn from it."*



Photo Credit: i'ina Van Lawick

## Signs of Autumn

*By Kurt Roblek, Deputy Project Leader,  
Nisqually National Wildlife  
Refuge Complex*

Signs of autumn are all around us, can you sense it? For each of us this may take on many wonderful and different experiences in the natural world. For the fisherperson, it may be observing the fall-run Chinook returning to their home stream while you hope for a nibble. For the star gazer, it may mean Orion or other "water" constellations dominating the night sky once again. For the botanist, it may be near the end of the growing season, but the golden hues keep your eyes satisfied. For the birder, it may be the excitement of cackling geese calling from overhead or the return of passerines at your feeder you just watched this spring stopping by for a quick snack. For us at Billy Frank Jr. Nisqually National Wildlife Refuge it is not only a time to prepare for winter maintenance projects and educational programs for students, but a time for us to observe the summer's

habitat management work and learn from it.

The Refuge's managed freshwater marshes are the perfect place to observe the changes of the seasons and how we manage them. The expanse of summer's green foliage is now mostly brown and the flowers have seeded out. We have by now systematically mowed, disced, plowed and mowed again specific areas of the marsh units paying attention to grass height and the phenology (maturity) of the seeds. Some areas will be patched-mowed leaving standing vegetation for habitat diversity and hiding places for wildlife. Other areas will be mowed completely for geese or to reduce invasive plant species coverage. After the marshes are flooded, the mowed and now decaying plant matter will in turn provide food for countless aquatic insects and migrating waterfowl. The ripe seeds will also replenish the seed bank for springtime growth in the newly disced and plowed areas.

Water levels in the managed marshes

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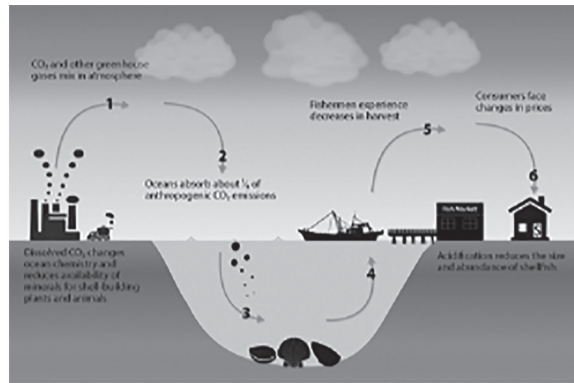
# Ocean Acidification and Shellfish in the Pacific Northwest

By Lynn Corliss, Associate Professor of Oceanography and Environmental Science, South Sound Community College

As the oceans are absorbing excess carbon dioxide from our atmosphere the pH continues to drop. This is known as ocean acidification. The Nisqually River estuary on our Refuge is an integral part of the Salish Sea that connects directly to the Pacific Ocean hence is a concern right here too. Ocean acidification spells trouble for our shellfish industry in the Pacific Northwest. Ocean acidification is also known as the “evil twin” of climate change. The oceans are absorbing over a quarter of the carbon dioxide that humans produce through the use of fossil fuels making the oceans more acidic. But there may be a tipping point where the ocean cannot absorb any more.

The Pacific Northwest is the canary in the coal mine when it comes to ocean acidification. Due to the topography and ocean currents, the Pacific Northwest is experiencing more corrosive waters than most coastal areas across the United States. The Pacific Northwest has a steep and narrow coastline which brings more acidic deep waters to the surface. Some of the upwelling and currents are bringing acidic waters from 30-50 years ago. Upwelling along with naturally occurring low aragonite (a form of calcium carbonate) levels, hypoxia (low dissolved oxygen) and inputs from freshwater watersheds leads to lower-than-normal levels of pH in Pacific Northwest

waters. The ocean has a pH that is alkaline or basic but most recently has dropped from 8.2 to 8.1. Neutral pH is 7. And while it might not seem like much, the pH scale is logarithmic (which increases/decreases by powers of 10). The range that most marine animals can tolerate is between 7.5 and 9 pH. Some of the pH readings in the Pacific Northwest have been as low as 7.5 pH in recent years. When the pH is this low, larvae shellfish have a hard time surviving and shellfish hatcheries need to buffer, lower the pH of their water. As shellfish grow, they need to pull calcium carbonate out of the water to make their shells. When there is too much carbon going into the water, it creates carbonic acid and reduces the amount of calcium carbonate available for shellfish to make their shells.



EPA.gov

According to the Pacific Shellfish Institute, Washington State alone has over 300 shellfish farms which brings in \$108 million annually. This amount only includes clams, oysters, mussels, and geoducks. Dungeness crabs and shrimp are also considered shellfish and contribute a significant amount of income to our state as well. Shellfish are an important part of our economy, and it is all being

threatened by ocean acidification. Scientists are trying to find ways to predict when these upwelling events will happen so that hatcheries raising the hatchlings can be prepared. Shellfish hatcheries are being forced to buffer their water in the tanks with diluted soda ash when these events occur, or if on the beach move their operations to more favorable waters. Unfortunately the frequency, duration, and intensity of these upwelling events are increasing and thus has many stakeholders concerned about the future of shellfish.

Some of those shellfish farms are on tribal lands. Tribes in the state of Washington are able to harvest half of the shellfish in our state according to the Rafeedie Decision of 1994. The Northwest Indian Fisheries Commission and tribes like the Swinomish are leading the way in both research and restoration. The Swinomish tribe is focused on both the restoration of Olympia oysters and clams. Since the Olympia oyster is native and has experienced more acidic waters than non-native oysters, it may be more resistant to corrosive waters and sea levels rise due to climate change.

Many marine species depend on oyster reefs and shellfish beds including different species of snails, crabs, shrimp, sponges, anemones, worms, and fish. These species feed other important recreational fish, migrating whales, and shorebirds. According to the National Oceanographic and Atmospheric Association (NOAA)

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[www.fws.gov/refuge/billy\\_frank\\_jr\\_nisqually](http://www.fws.gov/refuge/billy_frank_jr_nisqually)

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**Save trees, think green.**

To receive *The Flyway* electronically, email [nisqually@fws.gov](mailto:nisqually@fws.gov)

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# Welcome Zoie Anderson and Dominique Rosario, New AmeriCorps Members

By Davy Clark, Education Program Manager,  
Billy Frank Jr. Nisqually NWR

Each year two people serve as education coordinators at Billy Frank Jr. Nisqually & Grays Harbor National Wildlife Refuge through AmeriCorps. These service positions involve members spending ten and a half months coordinating all the day-to-day operations of environmental education activities at both Refuges. AmeriCorps is a network of national service programs committed to improving lives and fostering civic engagement. AmeriCorps Members commit their time to address critical community needs like increasing academic achievement, mentoring youth, fighting poverty, sustaining public lands, preparing for disasters, and more. The AmeriCorps program is administered through the Corporation for National and Community Service, the federal agency that leads service, volunteering, and grant-making efforts in the United States. Read on to find out more about this year's AmeriCorps members serving with our environmental education programs.

## Zoie Anderson

As a Washingtonian, I grew up loving the Pacific Northwest and exploration of wildlife. My father was a state park ranger, so we lived in a handful of parks, but my favorite was Camano Island State Park. For most of my childhood we were in the Olympia area and remember taking a field trip or two out to Billy Frank Jr. Nisqually Wildlife Refuge. I attended the University of Idaho and graduated in 2021 with a Bachelor of Science in Wildlife Resources. While attending the University of Idaho I assisted in research with burrowing owls, rough-legged hawks, red tailed hawks, and the greater sage-grouse. Most of the research involved safely capturing the birds,



collecting data about its current condition, and deploying GPS trackers on them. After graduating I knew I wanted to return to the Olympia area to share my newly found knowledge to the community I grew up in. I am excited to shift my bird knowledge to shorebirds which I grew up around but never took the time to learn about them. Now I get to serve as the Grays Harbor Education Coordinator and share knowledge on shorebirds!

## Dominique Rosario

I grew up in Austin, Texas where I found my love of nature through gardening, exploring the creek beds of the Greenbelt, and volunteering for local cleanups and trail maintenance days. After realizing I could study what I was most passionate about, I graduated with a double major in Spanish and Environmental Studies from Southwestern University in Texas. During college, I completed an internship in environmental education and fell in love with the field, educating others about the environment, and giving people the knowledge to make environmentally conscious decisions.

Following college, I moved to the Rocky Mountains of Colorado to continue my journey in environmental education and explore a new part of the country. It was there that I found my passion for educating others about local flora and fauna and the many connections between them.

My love for travel brought me here to Washington to serve with AmeriCorps. I am really excited for my position as the Billy Frank Jr. Nisqually Environmental Education Coordinator and learning about the Puget Sound flora and fauna. I am also looking forward to hiking and camping in the Pacific Northwest in my free time! ✈



## Acidification

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shellfish can provide other ecosystem services by removing excess carbon, improving water quality, and stabilizing shorelines. Oyster reef systems are important for biodiversity as well. Shellfish provide ecosystem services that are important for both estuarine species and humans alike. One study estimated that the ecosystem services of oyster reefs to be between \$2,226 and \$40,064 per acre. So much is at stake for both marine animals and humans alike.

Fortunately, Washington State created the Shellfish Initiative back in 2011. Our state saw a window of opportunity to pursue mitigation and policies to support a healthier marine ecosystem. Some of those recommendations include: reducing carbon emission and land-based contributions; increasing shellfish farmers and hatchery's ability to adapt and mitigate to the impacts of ocean acidification; invest in monitoring and research; educate and engage stakeholders, public and decision makers; and maintain a sustainable and coordinated effort to reduce ocean acidification. We can all do our own part to reduce greenhouse gas emissions, runoff, and pollution in our waters. This region and Washington state is poised to be a world leader showing what can be done in the face of climate change and ocean acidification. For more information on ocean acidification and what you can do to make a difference visit the following link:

<https://oceanconservancy.org/climate/what-is-ocean-acidification/> ✎



## Signs of Autumn

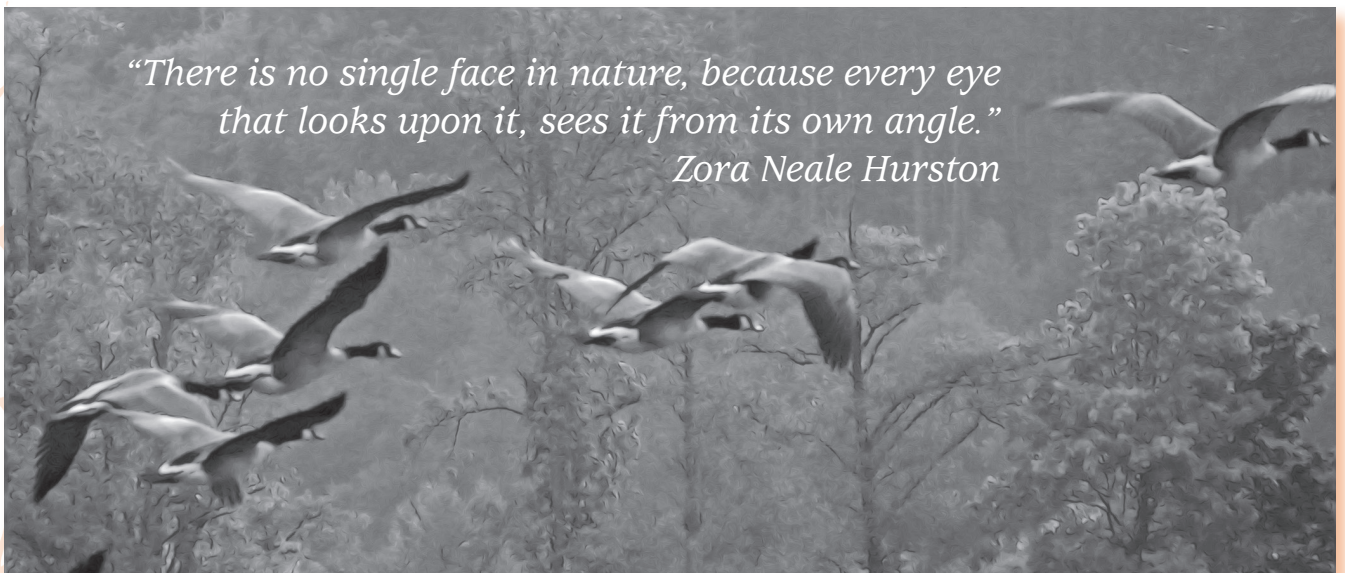
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are at their lowest point of the year. Fall rains and actively pumped well water will begin to pond behind water control structures (think small wooden dams). These dams in concert with swales and land topography allow for us to control the location and water depth of each managed marsh unit. The law of gravity dictates the

first marsh units to flood are south of the parking lots and from there, through the network of swales and water control structures, to the last near the estuary boardwalk. Managing the water of these units is both an art and a science. Slowly increasing the water depth allows for the land water interface (aka edges or shorelines) to continuously move up slope providing new and changing habitat for waterfowl. This is done by incrementally adding wooden boards (increasing dam height) to the water control structures

and moving from one unit "downstream" to the next. The maximum water depth is also important for dabbling ducks who need to reach the bottom to feed by topping over and not diving under. Managing water levels will continue until each marsh unit has reached capacity and then the cycle continues.

For us at the Refuge, the beauty of autumn is witnessing the spectacles of nature in its cyclical ways and how management of the marsh units provides changing habitat for newly arriving visitors both wildlife and human. ✎



Photos by i'ina Van Lawick



# New and Renewing Friends and Members, Fall 2021

## Student/ Senior—\$15

Margery Beeler  
Jean Davis  
Eileen Fletcher  
Joseph Geldmacher  
George Haroutunian, Jr.  
Sheila & Lonnie Harper  
Judy Hopkins  
Gerald Julian  
Juanita Kelly  
James Kenney  
Diane Kerlin  
Jo Ann McVeigh  
Glen Simmelink  
Phyllis Standefer

## Individual—\$25

Toby Brown  
Dianne Chaney  
Marcie Cleaver

Karol Erickson  
Nancy E. Henderson  
Kay Lennartson  
Diane Malone  
Marga Miner  
Stephanie Morris  
Michaelyn Olson  
Gerald Pumphrey  
Carole Smith  
Suna Todd  
Kay Townsend

## Family—\$50

Jennifer DeSelle–Milam  
Narda Pierce &  
Russ Cahill  
James & Ruth Hoss &  
Family  
Carol Mastronarde  
Andrew Mauro  
Elsa McLain  
Barb & Fritz Mondau

Alice Nevue & Family  
Floella Oatfield  
Ila Olson  
Tom & Lisa Ramsey  
Barnes  
Charles Strasser  
Janice E.T. Thuline  
Fred Ramalho  
Kelly Seago

## Supporting—\$100

Bob & Melanie Appel  
Nancy S. Chandler  
Lynn Corliss  
Care Deleeuw  
Carol Faubion



Christine Galvin  
Steve Wang &  
Kathryn Hamilton  
John & Sylvie Howard  
Shirley Hyink  
James Killingbeck  
Lin Livingston  
Shauna Madden  
Ralph & Kate Maughan  
Ruth E. O'Connell  
Beverly Sloane  
Allan M. Warner

## Partner—\$250

Dorothy Bailey  
Linda & Tim Bates  
Fred & Margaret Hellberg  
Nancy Faaren &  
John Rosenberg  
Ed Sakai  
Erika & Dan Tallman  
Maureen Traxler

# Join Friends of Nisqually NWRC!

Name \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Email \_\_\_\_\_

- ☐ Please send information on making Friends of Nisqually NWRC a beneficiary of my estate.  
☐ Check here to receive an electronic version of *The Flyway* newsletter by email.

## Individual/Family Memberships

- ☐ \$15 Student/Senior  
☐ \$25 Individual  
☐ \$50 Family  
☐ \$100 Supporting  
☐ \$250 Partner  
☐ \$500 Patron  
☐ \$1000 Benefactor

## Corporate/Business Memberships

- ☐ \$250 Business Sponsor  
☐ \$500 Community Partner  
☐ \$1000 Sustaining Business  
☐ \$2500 Corporate Patron  
☐ \$5000 + Corporate Benefactor

**Friends of Nisqually NWR Complex** is a 501(c)(3) nonprofit organization established in 1998 to promote conservation of the natural and cultural resources and fund educational and outreach programs at **Nisqually National Wildlife Refuge Complex**.

Please make checks payable to: Friends of Nisqually NWRC, 100 Brown Farm Rd, Olympia, WA 98516

**Your tax deductible contribution will help preserve the unique habitats, fish, and wildlife of the Nisqually Delta and the Grays Harbor Tideflats.**

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**Friends of Nisqually  
National Wildlife Refuge**

100 Brown Farm Road  
Olympia WA 98516

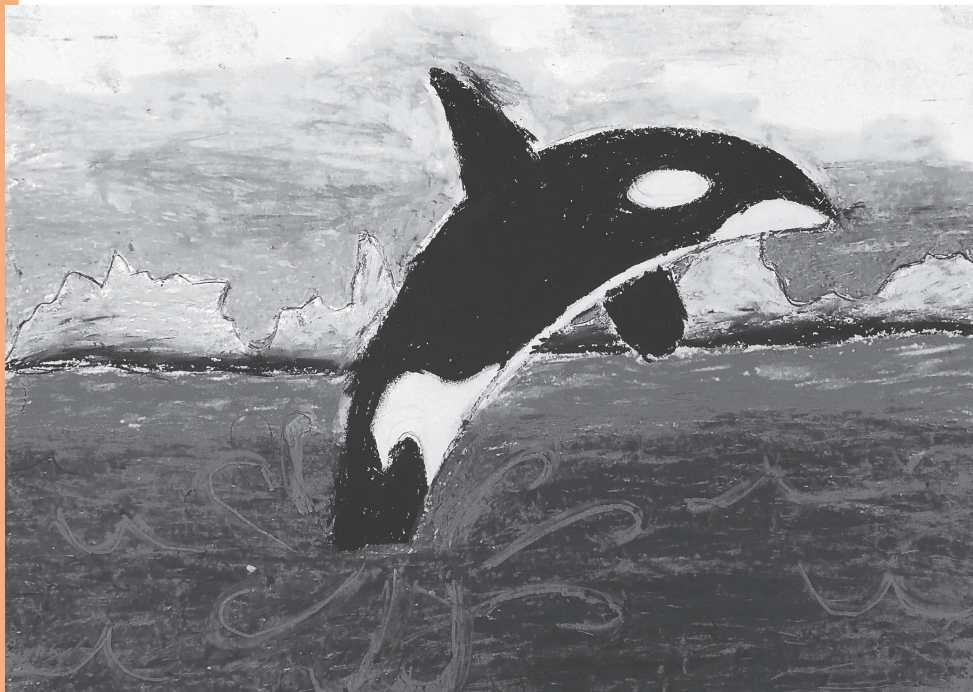
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**Aadil  
Kasmani  
wins Best  
of Show**

**for the 2021  
Nisqually  
Watershed  
Festival Poster  
Contest!**

Congratulations to Aadil Kasmani from Hansen Elementary. Aadil's artwork titled "Orca at Dusk" was selected as the Best of Show for the 2021 Nisqually Watershed Festival Poster Contest!

Artwork from 1st-6th grade students throughout the Nisqually Watershed and the surrounding area all explored this year's theme: "Mammals of the

Watershed". Over 200 amazing entries gave our judges a difficult job. Entries were received from 31 schools and 9 school districts.